

CLAIMS:

1. An apparatus for developing a latent image recorded on a movable imaging surface, including:

a reservoir for storing a supply of developer material including toner particles, said reservoir including a transport member;

a donor member being arranged to receive toner particles from said transport member and to deliver toner particles to the image surface at locations spaced apart from each other in the direction of movement of the imaging surface thereby to develop the latent image thereon;

a power supply, connected to said donor member, for biasing said donor member to deliver toner to the image surface during a printing mode of operation;

a second power supply, connected to the transport member, for maintaining a predefined voltage difference between the transport member and the donor member such that toner particles are attracted to the donor member from the transport member during a printing mode of operation;

means for generating a donor member purge signal trigger based on sensed or calculated development conditions; and

a power supply controller, responsive to said donor member purge signal, for changing the voltage between the donor member and the transport member during a second mode of operation thereby causing toner to partially or completely transfer back to said transport member and optionally transported to the imaging surface.

2. The apparatus of claim 1, wherein said power supplies apply a bias between donor member and transport member having a dc component between +30 and +200 during said printing mode of operation, and where a positive sign of bias is defined such that toner particles are attracted to the donor member from the transport member.

3. The apparatus of claim 1, wherein, during the purging mode of operation, said power supplies apply a bias between the donor member and the transport member having a dc component that is less than or equal to the dc bias used during the printing mode of operation, and where a positive sign of bias is defined such that toner particles are attracted to the donor member from the transport member.

4. The apparatus of claim 1, wherein said purging mode of operation is enabled during one or more periods selected from the group consisting of cycle up convergence, run time, and machine adjustment mode.

5. The apparatus of claim 1, wherein said purging mode is initiated once per 10 to 200 donor member revolutions.

6. The apparatus of claim 1, wherein said generating means includes either automatically adjusted or settable parameters that can be made the outcome of an algorithm that has as input development conditions and development response to the reverse bias donor roll cleaning cycle.

7. The apparatus of claim 1, wherein the donor member purge signal is triggered by detectors that sense development conditions.